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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,499	04/01/2004	Peter Chou	GS 201	8212

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EXAMINER

DOAN, THERESA T

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 10/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	Application No. 10/815,499	Applicant(s) CHOU ET AL.	
	Examiner Theresa T. Doan	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The Amendment filed on 07/31/06 has being acknowledged. By this amendment, claims 2-9 are pending in the application.
2. The indicated allowability of claims 4-5 and 8-9 from the previous Office Action is withdrawn because the applied prior art discloses the features as claimed.

Claim Objections

3. Claims 2, 4 and 5 are objected to because of the following informalities:

In claims 2, 4 and 5, lines 1-2, a phrase "A semiconductor device, comprising"
should be changed to "A semiconductor device, comprising:".

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 2-3 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Carter, Jr. et al. (U.S. Pat. 5,594,234).

Regarding claim 2, Carter (Figs. 4-5) discloses a semiconductor device,
comprising:

a bottom lead frame 31 having at least one tilt flap (34,35) (see Fig. 5);
a die 39 attached on the bottom lead frame 31;
a top conductive element attached on the die 39 (see Fig. 4, column 3, lines 43-46); and
a molding compound 40 for molding the semiconductor device, wherein the molding compound 40 surrounds the at least one tilt flap 34 to lock the molding compound onto the bottom lead frame 31, wherein the bottom lead frame 31 has a first edge 34 and a second edge 35 (see Fig. 5, column 3, lines 37-40), the first edge 34 opposite the second edge 35, and the second edge 35 of the bottom lead frame 31 having a reduced portion extending outward from the die-attached portion of the bottom lead frame (see Fig. 5, column 3, lines 37-40), wherein the reduced portion has a portion of the bottom lead frame removed from each of opposite sides thereof (see Fig. 4).

Regarding claim 3, Carter (Fig. 5) discloses the at least one tilt flap is provided at the first edge 34 and extends outward from the bottom lead frame 31.

Regarding claim 6, Carter (Fig. 5) discloses that the semiconductor device is a rectifier of surface mount package.

6. Claims 2-3 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakashima et al. (U.S. Pat. 6,388,311).

Regarding claim 2, Nakashima (Figs. 1b and 3c) discloses a semiconductor device, comprising:

- a bottom lead frame 4 having at least one tilt flap 6 (see Fig. 3c);
- a die 5 attached on the bottom lead frame 4;
- a top conductive element G attached on the die 5; and
- a molding compound 2 for molding the semiconductor device, wherein the molding compound 2 surrounds the at least one tilt flap 6 to lock the molding compound onto the bottom lead frame 4, wherein the bottom lead frame 4 has a first edge and a second edge 6A, the first edge opposite the second edge, and the second edge 6A of the bottom lead frame 4 having a reduced portion extending outward from the die-attached portion of the bottom lead frame (see Fig. 1b), wherein the reduced portion has a portion of the bottom lead frame removed from each of opposite sides thereof.

Regarding claim 3, Nakashima (Fig. 3c) discloses the at least one tilt flap is provided at the first edge 6 and extends outward from the bottom lead frame 4.

Regarding claim 6, Nakashima (Fig. 3c) discloses that the semiconductor device is a rectifier of surface mount package.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carter, Jr. et al. OR Nakashima in view of Carter, Jr. et al. (U.S. Pat. 6,465,274).

Neither Carter 234' nor Nakashima discloses the thickness of the bottom lead frame is less than 10 mils.

However, Carter 274' (Fig. 19) teaches a thickness of the bottom lead frame 1602 is about 8 to 10 mils (column 5, lines 32-35) to provide lower cost and better assembly (column 2, lines 52-54). Accordingly, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the device structure of Carter 234' or Nakashima by forming the thickness of the bottom lead frame is less than 10 mils to reduce the size of lead frame for providing lower cost and better assembly, as taught by Carter 274' (column 2, lines 52-54). Furthermore, it has been held that when the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

9. Claim 4-5 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carter, Jr. et al. (U.S. Pat. 5,594,234) in view of Admitted Prior Art (APA).

Carter (Figs. 4-5) discloses a semiconductor device, comprising: a bottom lead frame 31 having at least one tilt flap (34,35) (see Fig. 5); a die 39 attached on the bottom lead frame 31; a top conductive element attached on the die 39 (see Fig. 4, column 3, lines 43-46); and a molding compound 40 for molding the semiconductor device, wherein the molding compound 40 surrounds the at least one tilt flap 34 to lock the molding compound onto the bottom lead frame 31; wherein the bottom lead frame 31 has a first edge 34 and a second edge 35 (see Fig. 5, column 3, lines 37-40), the first edge 34 opposite the second edge 35, and the second edge 35 of the bottom lead frame 31 having a reduced portion extending outward from the die-attached portion of the bottom lead frame (see Fig. 5, column 3, lines 37-40), wherein the reduced portion has a portion of the bottom lead frame removed from each of opposite sides thereof (see Fig. 4), wherein the at least one tilt flap is provided at the first edge 34 and extends outward from the bottom lead frame (see Fig. 5).

Carter (Figs. 5 and 7a) also discloses the die pad 31 with the tilt flaps having the first edge 34 opposite the second edge 35 extending upward and outward to help lock the lead frame in the plastic package 40 (column 3, lines 47-50) and providing the force to hold the die mount pad against the bottom of the cavity mold during package molding (column 4, lines 13-14). Carter does not disclose the second edge of the bottom lead frame further comprises at least one tilt flap extending inward towards the bottom lead frame.

However, APA (Fig. 3) teach the second edge 34 of the bottom lead frame 30 having at least one tilt flap extending inward towards the bottom lead frame 30. Accordingly, it would have been obvious to form the second edge of the bottom lead frame having at least one tilt flap extending inward towards the bottom lead frame in Carter's structure, because such a forming the second edge having at least one tilt flap extending inward towards the bottom lead frame is not critical since the same effects of providing the force to hold the die mount pad against the bottom of the cavity mold during package molding would result, as taught by APA.

Response to Arguments

Applicant's arguments with respect to claims 2-9 have been considered but are moot in view of the new ground(s) of rejection.

The Applicant's arguments, addressed to the amended claims are considered in the rejections shown above.

Conclusion

10. This is non-final rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa T. Doan whose telephone number is (571) 272-1704. The examiner can normally be reached on Monday to Friday from 7:00AM - 4:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, WAEL FAHMY can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Theresa Doan
October 16, 2006.